

mistook them for *Impálas*, which, however, are not found on the Tana on either bank.

“It was only when I fired at the Gazelles, and the Hunter’s Antelopes (a pair of young males) ran away, that I noticed that they were something new to me. They ran with rather a heavy gallop like a Hartebeest. I then had a very long track after them, and managed to kill the young male which I first sent you.

“We did not come across these Antelopes again for some days, but then met with them in large numbers and got several specimens. They seemed to me to have more vitality than any other Antelope I have ever killed. This species certainly does not extend down to the coast, but we saw them as far as the furthest point we reached (about 250 miles) up the river, at a place called Mussa. Their Galla name is ‘*Herola*,’ not ‘*Haranta*,’ as given in your original description (*suprà*, p. 59).”

5. On the Oligochætoous Fauna of New Zealand, with preliminary Descriptions of new Species. By FRANK E. BEDDARD, M.A., F.R.S.E., Prosector to the Society.

[Received June 12, 1889.]

The only papers dealing with the Oligochæta of New Zealand are by Baird (4), Dr. Hutton (8), Mr. W. W. Smith (15), and myself (1, 2, 3). The papers of Dr. Hutton contain short descriptions of Earthworms, accompanied by a few figures illustrating the form of the prostomium and the distribution of the setæ. The species are all referred to the genera *Lumbricus* and *Megascolex*; but it is quite clear from Dr. Hutton’s statement as to their characters that a considerable number of species are wrongly identified with *Lumbricus*, and that they belong to other genera, especially to *Acanthodrilus*.

This is the case with *Lumbricus uliginosus*, which is possibly identical with either *Acanthodrilus novæ zelandiæ*, *A. dissimilis*, or *A. rosæ*. *Lumbricus campestris* may perhaps be my *Neodrilus monocystis*; it is stated by Captain Hutton to possess “male genital openings on the ninth segment. Vulvæ on the two last segments of the clitellum.” The “male genital openings” are clearly the spermathecal pores, while the “vulvæ” are no doubt the atrial pores. Inasmuch as Captain Hutton describes the atrial pores of *Lumbricus uliginosus* as occupying the last three segments of the clitellum, it seems possible that the presence of only two pairs of apertures in *L. campestris* may mean the atrial pores of the xviiith segment and the male pores of segment xviii., which I have recorded as characterizing *Neodrilus*. The systematic position of *Lumbricus levis* is hard to understand from the description given in Captain Hutton’s paper.

*Lumbricus annulatus* is, as Captain Hutton states, not far removed from *Allolobophora fetida*. Having examined specimens from New Zealand of a species which I cannot distinguish from *A. fetida*, I am inclined to think that there is no necessity to recognize *A. annulata*

as distinct. The statement that the latter form differs from its European ally in the presence of the male pores on segment xvi. (instead of xv.) requires careful verification.

The two species of *Megascolex* recorded by Hutton, although evidently differing from each other, are not sufficiently described to permit of their being recognized.

In a later paper (9), Captain Hutton gives a brief epitome of Perrier's memoir upon the Classification of Earthworms (13), and in a footnote states that his *Lumbricus uliginosus* is probably an *Acanthodrilus*, and that *L. levis* and *L. campestris* are probably referable to the genus *Digaster*. This paper was unknown to me when I published my earlier paper upon New-Zealand Earthworms (1).

#### GENUS ACANTHODRILUS, Perrier<sup>1</sup>.

*Mandane*, Kinberg, Öfvers. K. Vetensk.-Akad. 1866, p. 97.

*Acanthodrilus*, Perrier, Nouv. Arch. Mus. t. viii. (1872), p. 85.

Earthworms with 8 setæ, arranged either in pairs or the individual setæ implanted at some distance. Clitellum occupying more or fewer of segments xiii.-xix. Prostomium well developed. Vasa deferentia separate up to their point of opening on xviii.; two pairs of tubular atria (= *prostates*, auctorum) opening independently of vasa deferentia on to segments xvii. and xix. Penial setæ rarely absent (in *A. multiporus*). Oviducal pores paired upon segment xiv. Testes in x. and xi. Ovaries in xiii. Spermathecae two (rarely 3, in *A. communis*) pairs in viii. and ix., always furnished with diverticula.

##### 1. ACANTHODRILUS MULTIPORUS, F. E. B.

*Acanthodrilus multiporus*, F. E. Beddard, P. Z. S. 1885, p. 813.

##### 2. ACANTHODRILUS NOVÆ ZELANDIÆ, F. E. B.

*Acanthodrilus novæ zelandiæ*, F. E. Beddard, *ibid.* p. 813.

##### 3. ACANTHODRILUS DISSIMILIS, F. E. B.

*Acanthodrilus dissimilis*, F. E. Beddard, *ibid.* p. 813.

##### 4. ACANTHODRILUS ANNECTENS, F. E. B.

*Acanthodrilus annectens*, F. E. Beddard, Quart. Journ. Micr. Sci. vol. xxix. p. 102.

##### 5. ACANTHODRILUS ANTARCTICUS, n. sp.

*Prostomium* not completely dividing the buccal segment.

*Setæ* disposed in 8 longitudinal rows; 1 & 2 are closer together than 3 & 4.

*Dorsal pores* present in all segments after the vith.

*Clitellum* extends over segments xiii.-xvii.

<sup>1</sup> Rosa (14), on the grounds of priority, has reinstated Kinberg's name for this genus, inasmuch as Perrier has shown that *Mandane* and *Acanthodrilus* are synonymous. But Vaillant (16) has recently pointed out that Kinberg himself has used the generic name *Mandane* twice over; it was first used for a genus of marine Annelids. Under these circumstances I retain Perrier's name *Acanthodrilus*.

*Dorsal blood-vessel* completely double.

*Alimentary tract.* The gizzard occupies segments vi. & vii. Calciferous glands appear as a dilatation of the walls of the œsophagus in segments xiv. & xv.

*Intersegmental septa* dividing segments vii.–xii. specially thickened.

*Seminal sacs* in segments ix., x., xi., xii.; those of the last two segments are racemose in appearance.

*Nephridia* diffuse, with numerous external pores.

*Spermatheca* furnished with a variable number of small diverticula.

#### 6. ACANTHODRILUS ROSEÆ, n. sp.

*Prostomium* completely dividing the buccal segment.

*Setæ* strictly paired, the pairs, at least in the posterior region of the body, being equidistant.

*Clitellum* extending over segments xiv.–xix.

*Dorsal pores* present in the posterior segments of body.

*Dorsal blood-vessel* double, but the two tubes unite at the point where they perforate the septa.

*Intersegmental septa* not specially thickened in the anterior segments.

*Nephridia* one pair to each segment, alternating in position, sometimes opening by dorsal, sometimes by ventral pair of setæ.

*Spermatheca* with a long muscular diverticulum, bearing at its extremity a cluster of small pouches.

#### Genus DEINODRILUS, F. E. B.

*Deinodrilus*, F. E. Beddard, Quart. Journ. Micr. Sci. vol. xxix. p. 105.

Earthworms with 12 setæ in each segment, arranged at approximately equidistant intervals. Prostomium not completely dividing buccal lobe. Clitellum occupies 3 segments (xiv.–xvi.) as in *Perichæta*. Nephridia diffuse, opening on to exterior by numerous pores in each segment. Reproductive organs as in *Acanthodrilus*, i. e. two pairs of tubular atria opening on to segments xvii. and xix. Vasa deferentia open on segment xviii. Dorsal blood-vessel completely double.

#### 7. DEINODRILUS BENHAMI, F. E. B.

*Deinodrilus benhami*, F. E. Beddard, Quart. Journ. Micr. Sci. vol. xxix. p. 105.

#### Genus PERICHÆTA, Schmarda.

*Perichæta*, Schmarda, Neue wirbellose Thiere, Bd. ii. p. 13.

*Megascolex*, Horst, Notes from Leyd. Mus. vol. v. p. 182.

*Perichæta*, Perrier, Nouv. Arch. Mus. t. viii. p. 96.

As the arrangement of the species of this very large genus is undergoing revision, I abstain from attempting a generic definition. The species described below perhaps merits generic separation, as it differs from most other species in such important points as the possession of tubular atria and paired nephridia.

## 8. PERICHÆTA INTERMEDIA, n. sp.

The *prostomium* does not divide the buccal segment.

The *setæ* form a nearly complete ring round each segment, failing for a short space in the mid-dorsal and mid-ventral lines.

*Dorsal pores* absent.

*Clitellum* ?

*Alimentary tract.* The gizzard lies in segment v. ; it is small and inconspicuous. The calciferous glands present the appearance of dilatations of the œsophagus in segments x. and xi.

*Nephridia* are a series of paired tubes, opening by laterally placed orifices.

*Sperm-sacs* in segments ix., x., xi., xii.

*Vasa deferentia* open on to segments x. and xi.

The *atrium* is tubular as in *Acanthodrilus* ; it is not furnished with a sac of penial setæ ; the vas deferens of each side appears to open in common with it.

*Intersegmental septa* separating segments viii.–xv. very greatly thickened.

*Receptacula ovarum* are conspicuous on the anterior septum of segment xiv.

*Spermathecæ* four pairs in segments v.–viii. ; each is furnished with a minute diverticulum lying to the inner side.

## 9. PERICHÆTA ANTARCTICA (Baird).

*Magascolex (Perichæta) antarctica*, Baird, Journ. Linn. Soc. vol. xi. p. 96.

*P. antarctica*, Beddard, Proc. Roy. Soc. Edinb. vol. xiv. p. 175.

## Genus NEODRILUS, F. E. B.

*Neodrilus*, F. E. Beddard, P. R. Soc. Edinb. vol. xiv. p. 157.

Closely resembling *Acanthodrilus*, but differing in the presence of only a single pair of tubular atria in segment xvii. and a single pair of spermathecæ in viii. Each spermatheca is furnished with a very large diverticulum lying in the anterior segment. *Nephridia* paired and alternate in position.

## 10. NEODRILUS MONOCYSTIS, F. E. B.

*N. monocystis*, F. E. Beddard, P. R. Soc. Edinb. vol. xiv. p. 157.

## RHODODRILUS, nov. gen.

*Setæ* in 8 series. *Clitellum* occupying segments xiv.–xvii. ; atria tubular ; penial setæ present ; vasa deferentia opening on to the exterior on the same segment (xvii.), but independently of atria ; gizzard present.

This genus comes near to *Cryptodrilus* and *Megascolides*, and possibly includes some species described by Fletcher (5) under these two genera. In the former genus I place those species with *lobate* atria like those of *Perichæta* ; *Megascolides* includes species which have *tubular* atria, *no* penial setæ, and a *clitellum* extending as far as segment xx. or further.

## 11. RHODODRILUS MINUTUS, n. sp.

A small species one inch in length.

*Prostomium* extending over a portion of peristomial ring, but not (?) completely dividing it.

*Dorsal pores* present after clitellum.

*Dorsal blood-vessel* single.

*Alimentary tract.* The gizzard occupies segment v. ; there are no calciferous glands.

*Intersegmental septa* separating segments vi.-xii. specially thickened.

*Sperm-sacs* in segments xi., xii. racemose.

*Nephridia* paired, opening in front of third setæ.

*Spermathecæ* four pairs in segments vi.-ix. ; each sac with a single diverticulum longer than spermatheca and dilated at its extremity.

## Genus TUBIFEX, Lamarck.

*Tubifex*, Lamarck, Hist. Nat. Anim. sans Vertèbres, t. iii. p. 228.

12. TUBIFEX RIVULORUM, Lamarck, Hist. Nat. Anim. sans Vertèbres, t. iii. p. 228.

## Genus LIMNODRILUS, Claparède.

*Limnodrilus*, Claparède, Mém. Soc. Phys. Genève, t. xvi.

## 13. LIMNODRILUS, sp. inc.

A species of *Limnodrilus* appears to occur very abundantly in New Zealand ; but as none of the specimens which I have examined were sexually mature, and as I have not had an opportunity of studying the living worm, I do not feel able to identify the species.

## Genus PHREORYCTES, Hoffmeister.

*Phreoryctes*, Hoffmeister, Die bis jetzt bekannten Arten aus der Familie der Regenwürmer, p. 40.

## 14. PHREORYCTES SMITHI, F. E. B.

*Phreoryctes smithii*, F. E. Beddard, Ann. & Mag. Nat. Hist. ser. 6, vol. i. p. 389.

Besides the above-named species, I have received examples of *Lumbricus* and *Allolobophora* which I have not yet worked out. Dr. Benham informs me that he has received specimens of a *Eudrilus* from New Zealand.

The list of New-Zealand Earthworms which is published in the present paper is principally based upon the examination of two large collections, which were kindly made for me by Mr. W. W. Smith in the neighbourhood of Ashburton, and of one collection which Prof. T. J. Parker, F.R.S., was so good as to forward me from Dunedin. As the same species occurred abundantly in all these collections, I suppose that the list which I am now able to present to the Society contains a fair sample of the earthworm fauna of the country.

I wish therefore to point out, of course with due reserve, the con-

clusions as to the distribution of the group to which my results appear to point.

(1) The oligochæteous fauna of New Zealand differs markedly from that of Australia; the characteristic genera, consisting of numerous species, are *Megascolides*, *Perichæta*, and *Cryptodrilus* (Fletcher, 5). The characteristic New-Zealand form is evidently *Acanthodrilus*, of which only one species has as yet been found in Australia. *Perichæta*, of which a large number of species occur in Australia, is not an abundant form in New Zealand. *Rhododrilus* and *Neodrilus* may be peculiar genera. *Deinodrilus* has not been met with elsewhere.

(2) The fauna of New Zealand presents a marked agreement with that of Kerguelen (Lankester, 10), Marion Island, Patagonia (Rosa, 14), the Falkland Islands (Beddard, MS.), and South Georgia (Michaelsen, 11); in all these places the only genus known being *Acanthodrilus*. With regard to the terrestrial Oligochæta, therefore, it seems permissible to speak of an "Antarctic fauna."

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